Amendments to the Claims

This listing of claims will replace all prior versions of claims in the application:

Listing of Claims:

1. *(Original)* A method of producing a plurality of fused aggregates forming a desired three-dimensional structure, the method comprising: depositing a layer of a matrix on a substrate; embedding a plurality of cell aggregates, each comprising a plurality of cells, in the layer of the matrix, the aggregates being arranged in a predetermined pattern; allowing at least one aggregate of said plurality of cell aggregates to fuse with at least one other aggregate of the plurality of cell aggregates to form the desired structure; and separating the structure from the matrix.

2. *(Original)* The method of claim 1 wherein the layer of the matrix constitutes a first layer, the plurality of cell aggregates constitutes a first plurality of cell aggregates, and the predetermined pattern constitutes a first predetermined pattern, the method further comprising the steps of: depositing a second layer of the matrix on the first layer; and embedding a second plurality of cell aggregates in the second layer, the second plurality of cell aggregates comprising a plurality of cells, the second plurality of cell aggregates being arranged in a second predetermined pattern, and allowing at least one cell aggregate in the first plurality of cell aggregates to fuse with at least one cell aggregate in the second plurality of cell aggregates.

3. *(Original)* The method of claim 2 wherein the first and second predetermined patterns are substantially the same, and wherein the second plurality of cell aggregates is embedded in the second layer of the matrix in registration with the first plurality of cell aggregates.

4. *(Original)* The method of claim 2 wherein the desired structure is a tube, the first and second predetermined patterns are both circular in shape, and the second plurality of cell aggregates is embedded in the second layer of the matrix in registration with the first plurality of cell aggregates.

5. *(Original)* The method of claim 1 wherein the thickness of the layer of the matrix is about equal to the average diameter of the plurality of cell aggregates.

6. *(Original)* The method of claim 1 wherein the cell aggregates are substantially spherical.

7. *(Original)* The method of claim 1 wherein the cell aggregates are substantially uniform in size.

8. *(Original)* The method of claim 1 wherein the cell aggregates have an average size between about 100 and about 600 microns.

9. *(Original)* The method of claim 8 wherein no more than about 10% percent of the cell aggregates deviate from said average size by more than 5%.

10. *(Canceled)*

11. *(Original)* The method of claim 1 wherein the cell aggregates consist essentially of cells of a single type.

12. *(Original)* The method of claim 1 wherein at least one of the cell aggregates comprises a plurality of cells of a first type and a plurality of cells of a second type that is different from the first type.

13. *(Original)* The method of claim 12 wherein said at least one cell aggregate comprises a mixture of said cells of the first type and said cells of the second type and the method further comprises the step of allowing at least some of the cells of the first type to segregate from at least some of the cells of the second type.

14. *(Original)* The method of claim 13 wherein the cells of the first type are epithelial cells and the cells of the second type are connective tissue-forming cells.

15. *(Original)* The method of claim 1 wherein the predetermined pattern comprises a ring.

16. *(Original)* The method of claim 1 wherein the matrix comprises a gel.

17. *(Original)* The method of claim 1 wherein said plurality of cell aggregates includes at least one cell aggregate consisting essentially of cells of a first type and at least one other cell aggregate consisting essentially of cells of a second type different from the first type.

18-51. *(canceled)*

52. *(Original)* A three-dimensional layered structure comprising: at least one layer of a biocompatible matrix; and a plurality of cell aggregates, each cell aggregate comprising a plurality of living cells; wherein the cell aggregates are embedded in the at least one layer of biocompatible matrix in a predetermined pattern.

53. *(Original)* The structure of claim 52 wherein the cell aggregates are substantially uniform in size and shape.

54. *(Original)* The structure of claim 52 wherein the cell aggregates are cylindrical.

55. *(Original)* The structure of claim 54 wherein the cylindrical cell aggregates are from about 100 microns to about 600 microns in height.

56. *(Original)* The structure of claim 52 wherein the cell aggregates are substantially spherical.

57. *(Original)* The structure of claim 56 wherein the substantially spherical cell aggregates are between about 100 and about 600 microns in diameter.

58. *(Original)* The structure of claim 52 wherein each cell aggregate comprises a plurality of living cells of a single cell type.

59. *(Original)* The structure of claim 52 wherein each cell aggregate comprises a plurality of living cells of a first cell type and a plurality of living cells of a second cell type, the second cell type being different from the first cell type.

60. *(Original)* The structure of claim 52 wherein the plurality of cell aggregates comprises a plurality of cell aggregates of a first cell type and a plurality of cell aggregates of a second cell type, the second cell type being different from the first cell type.

61. *(Original)* The structure of claim 52 wherein the layer of biocompatible matrix is about

100 microns to about 600 microns thick.

62. *(Original)* The structure of claim 52 wherein the biocompatible matrix is selected from the group consisting of thermo-reversible gels, photo-sensitive gels, pH-sensitive gels, cell type specific gels, and combinations thereof.

63. *(Original)* The structure of claim 52 wherein the at least one layer of biocompatible matrix comprises at least two different types of biocompatible matrices.

64. *(Original)* The structure of claim 52 comprising: a first layer of the biocompatible matrix; and a second layer of the biocompatible matrix deposited on the first layer; wherein the cell aggregates are embedded in the first layer and in the second layer in a predetermined pattern.

65. *(Original)* The structure of claim 64 further comprising at least one additional layer of the biocompatible matrix deposited on the second layer, wherein the cell aggregates are embedded in the first layer, the second layer, and the at least one additional layer in a predetermined pattern.

66. *(Original)* The structure of claim 64 wherein the first layer comprises a type of biocompatible matrix that is different from the type of biocompatible matrix in the second layer.

67. *(New)* An apparatus for making a desired three-dimensional tissue structure, the apparatus comprising a dispensing unit under the control of a control unit, wherein the dispensing unit dispenses cell aggregates and/or bio-ink.

68. *(New)* The dispensing unit of claim 67, wherein the control unit is a computer.

69. *(New)* The dispensing unit of claim 68, wherein the control unit stores a blueprint of a target organ, tissue, or three-dimensional tissue structure.

70. *(New)* The dispensing unit of claim 69, wherein the control unit further stores information on gels or polymers to be used in conjunction with cell aggregates and/or bio-ink.

71. *(New)* The dispensing unit of claim 70, wherein the dispensing unit is in electronic communication with the control unit.

72. *(New)* The dispensing unit of claim 67, wherein the dispensing unit comprises a plurality of dispensers.

73. *(New)* The dispensing unit of claim 72, wherein the dispensers separately hold one or more compositions comprising bio-ink and/or cell aggregates and one or more gel or polymer.

74. *(New)* The dispensing unit of claim 72, wherein the dispenser is a cylindrical container.

75. *(New)* The dispensing unit of claim 67, further comprising a dispensing platform.

76. *(New)* The dispensing unit of claim 75, wherein the dispensing platform is temperature controlled.

77. *(New)* The dispensing unit of claim 67, wherein the dispensing unit deposits a composition comprising bio-ink, cell aggregates, gels, and/or polymers according to instructions from the control unit.

78. *(New)* An apparatus for making bio-ink particles, the apparatus comprising an extrusion system adapted to receive a container containing a pellet comprising a plurality of living cells and to extrude the pellet through an orifice; and a cutting system operable to cut the extrudate into a plurality of pieces as the extrudate is being extruded through the orifice.

79. *(New)* The apparatus of claim 78, wherein the orifice is circular.

80. *(New)* The apparatus of claim 78, further comprising a control unit operable to control operation of the extrusion system and operation of the cutting system.

81. *(New)* The apparatus of claim 80, wherein the control unit is operable to coordinate operation of the cutting system with operation of the extrusion system so the cutting system cuts the extrudate into substantially uniform pieces.

82. *(New)* The apparatus of claim 80, wherein the cutting system comprises an actuator and a cutting blade, the actuator being operable to slide the cutting blade past the orifice.

83. *(New)* The apparatus of claim 78, wherein the extrusion system comprises a motor and a piston drivingly connected to the motor, the motor being operable to advance the piston through a container containing said extrudate.

84. *(New)* The apparatus of claim 83, in combination with said container.